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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/609,179	06/27/2003	Larry Wayne Mobley	62674A	7650
109	7590	12/05/2006	EXAMINER	
THE DOW CHEMICAL COMPANY INTELLECTUAL PROPERTY SECTION, P. O. BOX 1967 MIDLAND, MI 48641-1967			SELLMAN, CACHET I	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 12/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/609,179		MOBLEY ET AL.	
	Examiner		Art Unit	
	Cachet I. Sellman		1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) 28-43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgement is made of the amendment filed by the applicant on 8/23/2006, in which claims 1, 5, and 8-10 were amended and claim 4 was cancelled. Claims 1-3, and 5-27 are currently pending in U.S. Application Serial No. 10/609179.

Response to Arguments

1. Applicant's arguments filed 8/23/2006 have been fully considered but they are not persuasive. The applicant argues that the Kukkala et al. reference does not teach using the aqueous polyurethane dispersion with synthetic leather. However, Kukkala et al. teaches that the dispersion can be used as a sealant for application to leather substrates and synthetic equivalents (col. 11, lines 5-6) and to form foams, and binders for nonwovens (col. 11, line 21-24). Therefore the Kukkala et al. reference does teach the use of the dispersion with synthetic leather substrates.
2. The applicant argues that Kukkala et al. does not teach that the dispersions are stabilized with the presence of an external stabilizing surfactant. However col. 4, lines 38-42 states that the dispersion takes place in the presence of dispersing aids such as surfactants.
3. The applicant states that Spek requires foaming of the polyurethane dispersion and there is no reference to the use of multivalent cation neutral salts as coagulants. However, the claim is not limited to only the steps in the claim, additional steps can be performed such as foaming and Spek teaches the use of multivalent cation neutral salts as the coagulant in col. 6, lines 47-54.

Art Unit: 1762

4. The applicant argues that the Hoersch reference teaches a foamed aqueous polyurethane and not a frothed aqueous polyurethane. However, according to Merriam-Webster (<http://www.m-w.com/cgi-bin/dictionary>) froth means to cause to foam therefore the Hoersch references inherently teaches frothing.

5. The applicant argues that the Hoersch reference does not teach the use of a stabilizer to stabilize the foam. However, paragraphs 0031-0032 of Hoersch teaches the use of a foam stabilizer.

6. Applicant's arguments with respect to claims 1 and 12-14 rejected under 35 USC 102 by Hoersch have been considered but are moot in view of the new ground(s) of rejection. The applicant has amended claim 1 to include the limitation of claim 4 of using a multivalent cation neutral salt as the coagulant.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-3, 5, 6, and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek et al. (US 4833173) and Kukkala et al. (US 5859111).

Spek discloses a method for coagulating materials such as textile cloth by impregnating it into an impregnating bath containing a coagulable polymer latex and a

Art Unit: 1762

heat-coagulant and a chemical or physical foaming agent, followed by coagulation.

Spek further discloses that the coagulation takes place in a bath, which contains hot water and a salt of the alkali and earth alkaline metals of hydrogen chloride, nitric acid, sulphuric acid or water soluble salts of aluminum, iron, manganese, cobalt, cadmium, chromium and others which are multivalent cation neutral salts (column 6, lines 47-54)

Spek does not teach the use of a nonionizable polyurethane or the use of an externally stabilizing surfactant as required by **claim 1**.

Kukkala et al. discloses a process for preparing an aqueous polymeric dispersion which comprises the steps of using a nonionizable polyurethane (column 2, lines 24-30), dispersed in water with a dispersing aid such as a surfactant (column 2, lines 46-55 and column 3, lines 5-6). Kukkala teaches that the use of internal dispersing agents results in pH instability and reduced water and solvent resistant and that the use of the nonionizable polyurethane does not require an organic solvent which reduces cost because it eliminates the distilling step (column 1, lines 23-59). Kukkala et al. further discloses that the dispersion can be used to make synthetic leathers (column 11, lines 3-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek to include the polymeric dispersion taught by Kukkala et al. One would have been motivated to do so because

Art Unit: 1762

Kukkala et al. teaches a polyurethane dispersion that can be used with textile substrates and for forming synthetic leathers that has pH stability, and good water and solvent resistance and does not require the use of an organic solvent which saves in production cost and Spek discloses a process for forming synthetic leather using a polyurethane dispersion therefore one would have a reasonable expectation of success in forming the synthetic leather which has good water resistance.

As mentioned above the process is performed in the absence of an organic solvent as required by **claims 2 and 3**. As stated above, Spek discloses that the coagulation takes place in a bath, which contains hot water and a salt of the alkali and earth alkaline metals (column 6, lines 47-54) as required by **claim 5**. Spek discloses in an example where an impregnated cloth is immersed in a coagulating bath for 30 seconds (column 10, lines 39-42) as required by **claims 8-10**.

Spek in view of Kukkala et al. does not disclose the use of calcium nitrate, magnesium nitrate, strontium nitrate and barium nitrate or mixture thereof as a coagulant as required by **claim 6**.

Spek in view of Kukkala et al. does disclose the use of an alkaline earth metal salt of nitric acid, which would be a nitrate of the alkaline earth metals. It would have been obvious to one having ordinary skill in the art to use the alkaline earth metal salts as the coagulant because Spek in view of Kukkala et al. disclose that all alkaline earth

Art Unit: 1762

metal salts are operable coagulants hence the use of any of the claimed species would have been expected to be operable, especially absent a showing of criticality for using the claimed alkaline earth metals as opposed to the alkaline earth metals which are not claimed.

9. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek et al. in view of Kukkala et al. as applied to claim 1 above and further in view of Hoersch (US 2004/0253370 A1).

The teachings of Spek in view of Kukkala et al. as applied to claim 1 are as stated above.

Spek does not teach applying a frothed polymeric dispersion after coagulating the impregnated textile to form a synthetic leather having a poromeric layer thereon as required by **claim 15**.

Hoersch discloses the use of a frothed aqueous polyurethane dispersion on a textile substrate in order to obtain a synthetic suede leather, which has pleasant appearance, good feel and excellent color stability [0005].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek in view of Kukkala et al. to include the step of applying a frothed aqueous polyurethane dispersion to the impregnated textile. One would have been motivated to do so because both teach

Art Unit: 1762

processes for impregnating textiles to resemble leather and Hoersch further teaches that using the frothed aqueous polyurethane dispersion results in a synthetic leather which has pleasant appearance, good feel and excellent color stability therefore one would have a reasonable expectation of success in forming the synthetic leather with the benefits described by Hoersch.

Hoersch further discloses that the frothed polymeric dispersion is an aqueous externally stabilized polyurethane dispersion [abstract, 0029-0032] as required by **claim 16**.

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Kukkala et al. and Hoersch as applied to claims 15 and 16 above and further in view of Shkapenko et al. (US 3598780).

The teachings of Spek in view of Kukkala et al. and Hoersch as applied to claims 15 and 16 are as stated above.

Spek in view of Kukkala et al. and Hoersch does not teach leaching the synthetic leather in water after drying as required by **claim 17**.

Shkapenko et al. discloses a method for forming a foamed polyurethane that is applied to a substrate and is used to make substituted leather (column 1, lines 30-63). The foamed polyurethane is applied to a substrate such as fabric then is washed with

Art Unit: 1762

clear water and is dried, after drying the coating is leached with warm water to produce micropores within the film (column 3, lines 9-25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Spek in view of Kukkala et al. to include the step of leaching the synthetic leather in water as taught by Shkapenko et al. One would have been motivated to do so because both Spek in view of Kukkala et al. and Hoersch and Shkapenko et al. teach processes for forming synthetic leathers that use foamed polyurethanes and Shkapenko et al. further teaches that leaching the synthetic leather forms micropores which is desired in a poromeric layer therefore one would have a reasonable expectation of success in forming the synthetic leather with a poromeric layer.

11. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Spek et al. (US 4833173) in view of Hoersch (US 2004/0253370 A1).

Spek discloses a method of impregnating a textile substrate with a polymer in order to form synthetic leather.

Spek does not teach applying a frothed aqueous polyurethane dispersion that has an externally stabilizing surfactant to the impregnated textile then heating it to a temperature sufficient to dry and cure the product to form the synthetic leather having a poromeric layer as required by **claim 18**.

Hoersch discloses the use of a foamed aqueous polyurethane dispersion to supply a synthetic leather that has a pleasant appearance and good feel as well as excellent color stability [abstract and 0005]. The foamed aqueous polyurethane dispersion is applied to a textile and is dried and cured [0053-0056].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek to include the step of applying a foamed aqueous polyurethane dispersion of Hoersch. One would have been motivated to do so because both teach process for forming synthetic leathers using nonwoven and woven textiles as well as polyurethane dispersions and Hoersch further discloses that the use of the foamed aqueous polyurethane dispersion results in a leather having pleasant appearance, good feel and excellent color stability therefore one would have a reasonable expectation of success in forming the synthetic leather with a poromeric surface.

Hoersch disclose that the frothed aqueous polyurethane can be an aromatic polyisocyanate such as 4,4',-2,4'- or 2,2'- diisocyanato diphenyl methane [0016] as required by **claims 19 and 20**. The polyurethane dispersion is frothed mechanically [0050] as required by **claim 21**. In regards to **claim 27**, Hoersch does not disclose the addition of an organic solvent in any step in the process therefore it would be obvious to one that it is performed essentially free of organic solvents.

Art Unit: 1762

12. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek et al. in view of Hoersch as applied to claim 18 above, and further in view of Goldner et al. (US 3169885) and Iwato et al. (US 6649273 B2).

The teachings of Spek in view of Hoersch as applied to claim 18 are as stated above.

Spek in view of Hoersch does not teach leaching the synthetic leather after drying using water essentially free of organic solvents for a time sufficient to remove at least about 10% , 50%, or 70% of the externally stabilizing surfactant as required by **claims 22-24**.

Goldner et al. discloses a process for forming novel leather substitutes that have hand or feel of leather, breathability of leather, and good tear strength and resistant to tearing (column 1, lines 10-17). The process consist of using a polyesterurethane solution with a surfactant where the breathability and hand of leather is improved by leaching the leather at low temperatures (12-20°C) for 9-16 hours or at higher temperatures (40-60°C) for 10 minutes – 3 hours and after leaching the fabric is dried (column 2, lines 3-35).

Iwato et al. discloses coating a substrate with a aqueous emulsion wherein the emulsion a surfactant is used and results in improved water repellency and heat

Art Unit: 1762

resistance (column 1, lines 6-11). In the process of Iwato. et al. a substrate is coated with the solution, is then dried and finally after drying is washed with water to remove the remaining surfactant (column 5, lines 18-35).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek in view of Hoersch to include the step of leaching the synthetic leather to remove the surfactant as taught by Goldner et al. and Iwato et al. One would have been motivated to do so because Goldner et al. teaches that the leather will have better breathability and feel by leaching the fabric to remove the surfactant and Iwato et al. further teaches that in order to remove all of the surfactant the leather should be washed with water after drying and Spek in view of Hoersch teach a process for forming a synthetic leather with good feel therefore one would have a reasonable expectation of success in forming the synthetic leather.

13. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spek in view of Hoersch as applied to claim 18 above and further in view of Gribble et al. (US 2004/0109992 A1).

The teachings of Spek in view of Hoersch as applied to claim 18 are as stated above.

Art Unit: 1762

Spek in view of Hoersch does not teach the use of an externally stabilized surfactant that is a mixture of an anionic and an amphoteric, such as betaine, surfactant as required by **claims 25 and 26**.

Gribble et al. discloses a method for making a frothed aqueous polyurethane foam that can be used on textiles (abstract). Gribble et al. discloses the use of foam frothing and stabilizing surfactants to obtain a lower density foam while still maintaining desired foam properties like abrasion resistance, tensile, tear, and elongation, wet strength, toughness, and adhesion to textile [0028]. Gribble further discloses that desired physical properties of the foam can be obtained by using a combination of anionic and Zwitterionic surfactants, which aids the dispersion stability of the filler without negatively affecting the froth and foam stability [0042]. The Zwitterionic surfactant can be N-alkylbetaines [0038].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process taught by Spek in view of Hoersch to include the use of an anionic and Zwitterionic (amphoteric) surfactant in the aqueous dispersion as taught by Gribble et al. One would have been motivated to do so because both teach processes for using a frothed aqueous polyurethane dispersion with textile substrates and Gribble et al. further discloses that using an anionic and amphoteric surfactant in combination results in a foam that has desired physical properties as well as aids the in the dispersion ability of the filler and does not negatively affects froth and foam stability

therefore one would have a reasonable expectation of success in forming a stabile frothed aqueous polyurethane dispersion that can be used with textiles.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cachet I. Sellman whose telephone number is 571-272-0691. The examiner can normally be reached on Monday through Friday, 7:00 - 4:30pm.

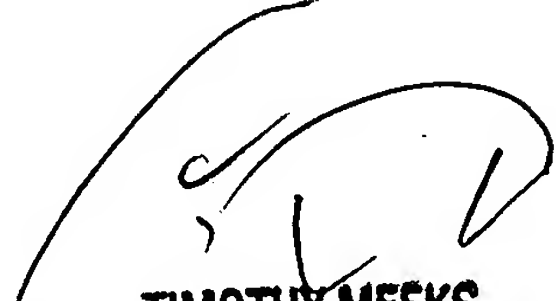
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1762

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Cachet I Sellman
Examiner
Art Unit 1762

cis



TIMOTHY MEEKS
SUPERVISORY PATENT EXAMINER